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Filed : March 18, 2004

### **REMARKS**

The foregoing amendments and the following remarks are responsive to the April 19, 2005 Office Action. Claims 1, 9, 13, 19, and 20 are amended and Claims 2-8, 10-12, and 14-18 remain as originally filed. Thus, Claims 1-20 are presented for further consideration. Please enter the amendments and reconsider the claims in view of the following remarks.

#### **Response to Provisional Rejection of Claims 1, 19, and 20 for Obviousness-Type Double Patenting**

In the April 19, 2005 Office Action, the Examiner provisionally rejects Claims 1, 19, and 20 under the judicially-created doctrine of obviousness-type double patenting as being unpatentable over Claims 1, 19, and 20 of copending U.S. Patent Application No. 10/690,833.

Upon indication that Claims 1, 19, and 20 of the present application are otherwise allowable, Applicants will consider submitting a Terminal Disclaimer to place these claims in condition for allowance.

#### **Response to Rejection of Claims 1-20 Under 35 U.S.C. § 103(a)**

In the April 19, 2005 Office Action, the Examiner rejects Claims 1-20 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,977,515 issued to Uraki et al. ("Uraki") in view of U.S. Patent No. 6,507,000 issued to Otsubo et al. ("Otsubo").

#### **Claim 1**

Applicants have amended Claim 1 to recite (emphasis added):

1. A laser head adapted to irradiate an interaction region of an inhabitable structure with laser light to remove material from the structure, the laser head comprising:

a housing;

**an anchoring mechanism reversably coupled to the housing and releasably affixed to the structure by vacuum pressure, the anchoring mechanism releasably holding the laser head at a selected position in relation to the structure;**

a connector coupled to the housing and optically coupled to a laser generator, the connector adapted to transmit laser light from the laser generator;

a first optical element contained in the housing and optically coupled to the connector, the first optical element adapted to receive laser light from the connector and reflect the laser light from the connector through a first non-zero angle;

a second optical element contained in the housing and optically coupled to the first optical element, the second optical element adapted to

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receive laser light from the first optical element and reflect the laser light from the first optical element through a second non-zero angle; and  
a containment plenum coupled to the housing, the containment plenum optically coupled to the second optical element to receive the laser light from the second optical element, the containment plenum adapted to confine the material and remove the material from the interaction region resulting from irradiating the structure with the laser light.

Applicants submit that amended Claim 1 includes limitations not disclosed or suggested by either Uraki or Otsubo. In particular, neither Uraki nor Otsubo discloses or suggests a laser head with an anchoring mechanism “reversably coupled to the housing and releasably affixed to the structure by vacuum pressure,” as recited by amended Claim 1.

Uraki discloses a laser system for processing surfaces of an underwater structure. As shown by Figure 19 of Uraki, a laser chamber 2 is mounted on a support structure 99-104 which is located above the water level 59. Uraki is silent regarding the connection between the laser chamber 2 and the support structure 99-104 and regarding the connection between the support structure 99-104 and the structure 97 upon which the laser operates. In addition, Uraki does not disclose or suggest using vacuum pressure to releasably affix the chamber 2 to the structure. Thus, Uraki does not disclose or suggest “an anchoring mechanism reversably coupled to the housing and releasably affixed to the structure by vacuum pressure” as recited by amended Claim 1.

Otsubo discloses a system for laser drilling of a workpiece and removing dust from the area being processed by the laser. For example, in Figure 1, Otsubo teaches a laser drilling machine having a movable lens 1, a workpiece 4 to be processed, and a dust removal system 3 between the lens 1 and the workpiece 4. Figure 1 of Otsubo discloses a gap E which is “required for allowing free movement[] of the workpiece” relative to the laser drilling system (see, e.g., Otsubo at column 2, lines 57-58). Accordingly, Otsubo does not disclose or suggest that the laser drilling machine is coupled to the workpiece, much less releasably or using vacuum pressure. Thus, Otsubo does not disclose or suggest that the laser drilling machine has “an anchoring mechanism reversably coupled to the housing and releasably affixed to the structure by vacuum pressure,” as recited by amended Claim 1.

Therefore, the combination of Uraki and Otsubo fails to disclose or suggest the claimed invention recited by amended Claim 1, so amended Claim 1 is patentably distinguished over

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Uraki in view of Otsubo. Applicants respectfully request that the Examiner withdraw the rejection of Claim 1 and pass Claim 1 to allowance.

Claims 2-18

As disclosed herein, Applicants have amended Claims 9 and 13. Each of Claims 2, 7, 8, and 10-13 depends from amended Claim 1, each of Claims 3-6 depends from Claim 2, amended Claim 9 depends from Claim 8, each of Claims 14-17 depends from amended Claim 13, and Claim 18 depends from Claim 17. Therefore, each of Claims 2-18 includes all the limitations of amended Claim 1, as well as other limitations of particular utility. Applicants respectfully request the Examiner to withdraw the rejection of Claims 2-18 and to pass these claims to allowance.

Claim 19

Applicants have amended Claim 19 to recite (emphasis added):

19. A laser head adapted to irradiate an interaction region of an inhabitable structure with laser light to remove material from the structure, the laser head comprising:

means for connecting the laser head to a laser generator;

**means for reversably affixing the laser head to the structure by vacuum pressure to releasably hold the laser head at a selected position in relation to the structure, wherein the affixing means is reversably coupled to other portions of the laser head;**

means for receiving the laser light from the laser generator;

means for directing the laser light to the interaction region; and

means for confining the material and removing the material from the interaction region.

Applicants submit that neither Uraki nor Otsubo teach or suggest a “means for reversably affixing the laser head to the structure by vacuum pressure to releasably hold the laser head at a selected position in relation to the structure, wherein the affixing means is reversably coupled to other portions of the laser head,” as recited by amended Claim 19. Applicants therefore submit that amended Claim 19 is patentably distinguished over Uraki in view of Otsubo. Applicants respectfully request that the Examiner withdraw the rejection of Claim 19 and pass Claim 19 to allowance.

Claim 20

Applicants have amended Claim 20 to recite (emphasis added):

A method of irradiating an interaction region of an inhabitable structure with laser light to remove material from the structure, the method comprising:

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connecting a laser head to a laser generator, the laser head comprising a housing and **an anchoring mechanism reversably coupled to the housing;**

**reversibly affixing the anchoring mechanism to the structure by vacuum pressure, thereby releasably positioning the laser head in a drilling position relative to the interaction region;**

receiving the laser light from the laser generator;

directing the laser light to the interaction region of the structure; and

confining the material and removing the material from the interaction region.

Applicants submit that neither Uraki nor Otsubo teach or suggest "an anchoring mechanism reversably coupled to the housing" and "reversibly affixing the anchoring mechanism to the structure by vacuum pressure, thereby releasably positioning the laser head in a drilling position relative to the interaction region," as recited by amended Claim 20. Applicants therefore submit that amended Claim 20 is patentably distinguished over Uraki in view of Otsubo. Applicants respectfully request that the Examiner withdraw the rejection of Claim 20 and pass Claim 20 to allowance


#### Summary

For the foregoing reasons, Applicants submit that Claims 1-20 are in condition for allowance, and Applicants respectfully request such action.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

Dated: 10/18/05

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